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EXAMINER	
PATEL, DHARTI HARIDAS	
ART UNIT	**PAPER NUMBER**
2836	

DATE MAILED: 02/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/789,327	CRANE ET AL.	
	Examiner	Art Unit	
	Dharti H. Patel	2836	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02/27/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou, Patent No. 6,804,127, in view of Kumar et al., Patent No. 6,023,137 and Rozman, Patent No. 6,252,751. With respect to claim 1, Zhou teaches an AC/DC/AC power conversion system, which comprises a variable speed drive. The variable speed drive [Fig. 3a, 1] comprises a converter stage [Fig. 3a, 10] to converter an AC voltage to a DC voltage, the converter stage being configured to be electrically connectable to an AC power source [Fig. 3a, 3, Col. 4, lines 64-67]; and a DC link stage [Fig. 3a, 30] to filter and store energy from the converter stage, the DC link stage being electrically connected to the converter stage [Col. 5, lines 8-9, Col. 6, lines 43-46]. However, Zhou does not disclose an inverter stage comprising a plurality of inverters electrically connected in parallel to the DC link stage and a plurality of connecting mechanisms connected in series between an inverter of the plurality of inverters and a corresponding motor of the plurality of motors.

Kumar teaches a method and apparatus for using a traction inverter to supply AC electric power for non-traction motor applications. Kumar teaches an

inverter stage [Fig. 3, INV 1-6] comprising a plurality of inverters electrically connected in parallel to the DC link stage, each inverter of the plurality of inverters [Fig. 3, INV 4-5] being configured to convert a DC voltage to an AC voltage to power a corresponding motor of a plurality of motors [Fig. 3, TM4, TM5], and each inverter of the plurality of inverters being configured to operate substantially independently of other inverters of the plurality of inverters; and a plurality of connecting mechanisms [Fig. 3, 60, or Fig. 5, 80], each connecting mechanism of the plurality of connecting mechanisms being connected in series between an inverter of the plurality of inverters and a corresponding motor of the plurality of motors.

Rozman teaches a method an apparatus for distributing alternating electrical current to motors via a direct current bus. Rozman teaches a plurality of connecting mechanisms wherein each connecting mechanism being configured to disconnected an inverter from a corresponding motor in response to receiving a control signal [Fig. 1, 16, Abstract, lines 8-17].

All three teachings are related by being variable speed drives for distributing alternating electrical current to motors via a converter stage and an inverter stage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Rozman and Kumar, which teaches an inverter stage, a plurality of connecting mechanisms and a control panel, with the power conversion system of Zhou because Kumar teaches that it is known to use a plurality of inverter/motor units, which avoids the

use of a single large inverter that may be subject to failure, with Rozman teaching that it is known to connect a plurality of load control units to a central controller to increase the ability of the system to handle the failure of one of the load/inverter branches.

With respect to claim 2, Rozman teaches a control panel [Fig. 1, 16] to generate the control signal for a connecting mechanisms [contactors] as disclosed in the Abstract, lines 8-17.

With respect to claim 3, Rozman teaches that the control panel [Fig. 1, 16] comprises means for detecting a fault condition in a motor of the plurality of motors [Fig. 1, 14]; and means for generating the control signal for the corresponding connecting mechanism connected to the motor with the detected fault condition in response to the detection of the fault condition in the motor as disclosed in the Abstract, lines 8-17.

With respect to claim 4, Rozman teaches that the control panel [Fig. 1, 16] comprises means for generating the control signal in response to a control instruction from a control system controlling a corresponding motor load connected to a motor of the plurality of motors [Fig, 1, 14] as disclosed in the Abstract, lines 8-17.

With respect to claim 5, Kumar teaches that the plurality of connecting mechanisms comprises a plurality of contactors [Fig. 5, 80].

With respect to claim 6, Kumar teaches a plurality of contactors [Fig. 3, 60 or Fig. 5, 80a-h] each comprise at least one normally open contact [the

contactors of Fig. 5 are normally opened or normally closed depending on the energized state of the system] and the control signal [Fig. 3, IMC4-5] de-energizes the at least one normally open contact of a contactor to disconnect an inverter [Fig.5, INV4 or INV5] from a corresponding motor [Fig. 3, TM4 or TM5].

With respect to claim 7, Kumar teaches a plurality of contactors [Fig. 3, 60 or Fig. 5, 80a-h] each comprise at least one normally closed contact [the contactors of Fig. 5 are normally opened or normally closed depending on the energized state of the system] and the control signal [Fig. 3, IMC4-5] energizes the at least one normally closed contact [Fig. 5, 80a-c] of a contactor to disconnect an inverter [INV 4] from a corresponding motor [Fig. 3, TM4].

2. Claims 8-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhou, Patent No. 6,804,127, in view of Kumar et al., Patent No. 6,023,137 and Rozman, Patent No. 6,252,751 as applied to claims 1-7 above, and further in view of Rafuse, Jr. et al., Patent No. 5,797,729. With respect to claim 8, Zhou teaches an AC/DC/AC power conversion system, which comprises a variable speed drive. The variable speed drive [Fig. 3a, 1] comprises a converter stage [Fig. 3a, 10] and a DC link stage [Fig. 3a, 30].

Kumar teaches a method and apparatus for using a traction inverter to supply AC electric power for non-traction motor applications. Kumar teaches an inverter stage [Fig. 3, INV 1-6], the inverter stage having a plurality of inverters [Fig. 3, INV 1-6] each electrically connected in parallel to the DC link stage and each powering a corresponding motor of a plurality of motors [Fig. 3, TM1-6]; a

plurality of contactors [Fig. 3, 60, or Fig. 5, 80], each contactor of the plurality of contactors being connected in series between an inverter of the plurality of inverters [Fig. 3, INV1-6] and a corresponding motor of the plurality of motors [Fig. 3, TM1-6].

Rozman teaches a method an apparatus for distributing alternating electrical current to motors via a direct current bus. Rozman teaches a plurality of contactors wherein each contactor being configured to enable or disable a connection between the inverter and the corresponding motor of the plurality of motors in response to receiving a control signal [Fig. 1, 16, Abstract, lines 8-17].

The references do not teach providing a refrigeration system with the drive system for a plurality of motors. However, Rafuse teaches a refrigeration system having a plurality of variable speed compressors, the refrigeration system comprising a plurality of compressors [Fig. 1, 10, 12, 14], each compressor of the plurality of compressors being driven by a corresponding motor [Fig. 1, 34, 36, 38], the plurality of compressors being incorporated into at least one refrigerant circuit [Fig. 1], each refrigerant circuit comprising at least one compressor of the plurality of compressors [Fig. 1, 10, 12, 14], a condenser arrangement [Fig. 1, 22] and an evaporator arrangement [Fig. 1, 16] connected in a closed refrigerant loop.

All four teachings are related by being variable speed drives for distributing alternating electrical current to motors via a converter stage and an inverter stage. It would have been obvious to one of ordinary skill in the art at the

time the invention was made to combine the teachings of Rozman, Kumar, and Zhour, which teaches a variable speed drive and a plurality of contactors, with the refrigeration system having a plurality of variable speed compressors of Rafuse for the benefit of increasing the efficiency of the refrigeration system employing variable speed compressors.

With respect to claim 9, Rozman teaches a control panel [Fig. 1, 16] to generate a control signal for each contactor of the plurality of contactors as disclosed in the Abstract, lines 8-17.

With respect to claim 10, Rozman teaches that the control panel [Fig. 1, 16] comprises means for detecting a fault condition in a corresponding motor of the plurality of motors [Fig. 1, 14]; and means for generating a control signal for a corresponding contactor connected to the corresponding motor with the detected fault condition to disable the connection between the inverter and the corresponding motor with the detected fault condition as disclosed in the Abstract, lines 8-17.

With respect to claim 11, Rozman teaches that the control panel [Fig. 1, 16] comprises means for detecting a fault condition in a corresponding motor of the plurality of motors [Fig. 1, 14]; and means for generating a control signal for a corresponding contactor connected to the corresponding motor of the plurality of motors with the detected fault condition to disable the connection between the inverter and the corresponding motor of the plurality of motors with the detected fault condition as disclosed in the Abstract, lines 8-17.

With respect to claim 12, Rozman teaches that the control panel [Fig. 1, 16] comprises means for generating a control signal for a corresponding contactor connected to a corresponding motor of the plurality of motors [Fig. 1, 14] to enable the connection between the inverter and the corresponding motor of the plurality of motors as disclosed in the Abstract, lines 8-17.

With respect to claim 13, Kumar teaches that the plurality of contactors comprise a plurality of normally open contacts [Fig. 5, 80a"-c", 80a'-i'].

With respect to claim 14, Kumar teaches that the control signal [Fig. 3, IMC4-5] de-energizes the normally open contacts to disable the connection between an inverter [Fig.5, INV4 or INV5] and a corresponding motor of the plurality of motors [Fig. 3, TM4, TM5].

With respect to claim 15, Kumar teaches that the control signal [Fig. 3, IMC4-5] energizes the normally open contacts to enable the connection between an inverter and a corresponding motor of the plurality of the motors [Fig. 5, TM4, TM5].

With respect to claim 16, Kumar teaches that the plurality of contactors comprise a plurality of normally closed contacts [Fig. 5, 80a-i].

With respect to claim 17, Kumar teaches that the control signal [Fig. 3, IMC4-56] energizes the normally closed contacts to disable the connection between an inverter [Fig.5, INV5] and a corresponding motor of the plurality of motors [Fig. 5, TM5].

With respect to claim 18, Kumar teaches that the control signal [Fig. 3, IMC4-5] de-energizes the normally closed contacts [80g'-i'] to enable the connection between an inverter [INV 4] and a corresponding motor [TM4 through contactors 80a-c] of the plurality of the motors [Fig. 5, TM4, TM5].

3. With respect to claim 19, Zhou teaches an AC/DC/AC power conversion system, which comprises a variable speed drive. The variable speed drive [Fig. 3a, 1] comprises a converter stage [Fig. 3a, 10] to converter an AC voltage to a DC voltage, the converter stage being configured to be electrically connectable to an AC power source [Fig. 3a, 3, Col. 4, lines 64-67]; and a DC link stage [Fig. 3a, 30] to filter and store energy from the converter stage, the DC link stage being electrically connected to the converter stage [Col. 5, lines 8-9, Col. 6, lines 43-46].

Kumar teaches an inverter stage [Fig. 3, INV 1-6] comprising a plurality of inverters electrically connected in parallel to the DC link stage, each inverter of the plurality of inverters [Fig. 3, INV 4-5] being configured to convert a DC voltage to an AC voltage to power a corresponding motor of a plurality of motors [Fig. 3, TM4, TM5], and each inverter of the plurality of inverters being configured to operate substantially independently of other inverters of the plurality of inverters.

Rozman teaches a method an apparatus for distributing alternating electrical current to motors via a direct current bus. Rozman teaches a means for isolating a motor of the plurality of motors [Fig. 1, 14] from other motors in

response to detecting a fault condition in the motor of the plurality of motors [Fig. 1, 14] as disclosed in the Abstract, lines 8-17.

Rafuse teaches a drive system for a multiple compressor chiller system having a plurality of motors.

All four teachings are related by being variable speed drives for distributing alternating electrical current to motors via a converter stage and an inverter stage. It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Rozman, Kumar, and Zhour, which teaches a variable speed drive and a plurality of contactors, with the refrigeration system having a plurality of variable speed compressors of Rafuse for the benefit of increasing the efficiency of the refrigeration system employing variable speed compressors.

With respect to claim 20, Rozman teaches a means for isolating a motor comprises a plurality of contactors, each contactor of the plurality of contactors being connected in series between an inverter of the plurality of the inverters and a corresponding motor of the plurality of motors [Fig. 1, 14], and wherein each contactor being configured to disconnect an inverter from a corresponding motor of the plurality of motors with a detected fault condition as disclosed in the Abstract, lines 8-17.

With respect to claim 21, Kumar teaches that the plurality of contactors comprise a plurality of normally open contacts [Fig. 5, 80a"-c", 80a'-i'].

With respect to claim 22, Kumar teaches that the normally open contacts are de-energized to disconnect an inverter [Fig.5, INV4 or INV5] from a corresponding motor of the plurality of the motors [Fig. 3, TM4, TM5] with a detected fault condition.

With respect to claim 23, Kumar teaches that the plurality of contactors comprise a plurality of normally closed contacts [Fig. 5, 80a-i].

With respect to claim 24, Kumar teaches that the normally closed contacts are energized to disconnect an inverter [Fig.5, INV4 or INV5] from a corresponding motor of the plurality of the motors [Fig. 5, TM4, TM5] with a detected fault condition.

4. ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dharti H. Patel whose telephone number is 571-272-8659. The examiner can normally be reached on 8:30am - 5pm.
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 571-272-2800, Ext. 36. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DHP

01/27/2006

PHUONG T. VU
PRIMARY EXAMINER